REMARKS

Claims 8-28 are all the claims pending in the application. Applicant has canceled claims 1-7 without prejudice or disclaimer. Claims 8 and 15 stand objected upon informalities. Claims 9, 12-14, 16 and 19-21 stand rejected upon informalities. Claims 1-21 stand rejected on prior art grounds. In addition, the drawings and specification are objected to. Applicants respectfully traverse these objections/rejections based on the following discussion.

I. The Claim Objections

In response to the Examiner's comments, Applicant, as indicated above, has amended Claims 8 and 15.

However, Applicant traverses the objection that the claims should be update to replace "packet" with "segment." First, the MPEP clearly indicates that an Applicant may be its own lexicographer, which is the situation. Applicant consistently uses the term "packet" throughout the Application. Finally, Webster's Collegiate Dictionary, Tenth Edition, Page 834, clearly defines "packet" as "a short fixed-length section of data that is transmitted as a unit in an electronic communications network." Thus, use of the term "packet' is accurate and thus replacement with the term "segment" is unnecessary and no more descriptive.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these objections.

II. The 35 U.S.C. §112, Second Paragraph, Rejection

Claims 9, 12-14, 16 and 19-21 stand rejected under 35 U.S.C. §112, second paragraph. Applicant has amended the claims, as indicated above, in accordance with the Examiner's recommendations but has not canceled claims 14 and 21.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these rejections.

III. The Prior Art Rejections

Claims 1, 3-4, 8, 10-11, 15 and 17-18 stand rejected under 35 U.S.C. §102(b) as being anticipated by the article "Selective Slow Start: A simple Alogrithm For Improving TCP Performance in Wireless ATM Environment", by Varshney. Claims 2, 9 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the article "Selective Slow Start: A simple Alogrithm For Improving TCP Performance in Wireless ATM Environment", by Varshney, in view of RFC 2001 by Stevens. Claims 5-7, 12-14 and 19-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the article "Selective Slow Start: A simple Alogrithm For Improving TCP Performance in Wireless ATM Environment", by Varshney, in view of the article "Differentiation Congestion vs. Random Loss: Amethod for Improving TCP Performance over Wireless Links", by Parsa, et al. Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejection Based on Varshney

Regarding claims 8, 10-11, 15, 17 and 18, Varshney fails to disclose, teach or suggest the features of independent claim 8, and similarly independent claim 15, including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit. (See Page 10, line 4 – Page 12, line 15; Page 13, line 10-Page 14, line 11; and Figures 1-3).

First, Applicant agrees with the Examiner that Varshney is deficient and "does not disclose expressly the limitations recited in claims 13, and 20, as cited above. (See Office Action, Page 8, Section 11).

Indeed, Figure 3 of Varshney merely teaches a simple algorithm for improving TCP performance in a wireless ATM environment where "TCP will initiate slow start only if the number of lost TCP segments in the last S attempts exceeds a limit." "The TCP needs to keep track of segment losses and the time of their loss. After a timeout, the TCP will check if the number of segments lost in the last S attempts including the current one, exceeds a limit. If it does, then TCP will assume that these losses have been caused by the network congestion and will initiate slow start. Otherwise, it will continue to transmit as its current speed as if nothing has happened by retransmitting the lost segment and using the same timer values. Accordingly, Varshney does not disclose a process of choosing between alternate transmission protocols, let alone, choosing a first transmission protocol, a second transmission protocol and a third transmission protocol. Therefore, Varshney does not disclose, teach or suggest including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit.. (See Varshney , Page 465 at Abstract; Page 467, 1st Column; and Figure 3).

In contrast, Applicant's invention includes a system for improving TCP throughput over lossy communication links without affecting performance over non-lossy links. The system includes three states: a slowstart/congestion avoidance state (O), a Halt Growth State (H) and a k-recovery state (K). The 'k-recovery phase' reduces a congestion window to half its original size, while a slow-start threshold is reduced to half only on a first occasion of entry into the k-recovery phase during a packet loss recovery cycle. Accordingly, Applicant's invention forecasts or detects congestion. (See Page 6, lines 22-24; Page 8, lines 13-26; Page 11, lines 1-6; Page 11, line 22-Page 12, line 15; Page 13, line 10-Page 14, line 11).

Based on the above, the Applicant traverses the assertion that Varshney teaches Applicant's invention of independent claims 8 and 15, and related dependent claims 10-11, 17 and 18.

B. The Rejection Based on Varshney in view of Stevens

Regarding independent claims 8, and 15, and related dependent claims 9 and 16, first, the references, separately, or in combination, fail to disclose, teach or suggest a reason or motivation for being combined.

Second, even assuming that the references would have been combined, Varshney, as discussed above, does not teach or suggest the features of independent claim 8, and similarly independent claim 15, including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit. (See above).

Stevens is also deficient. Further, the Office Action does not expressly or implicitly indicate that Stevens discloses or suggests the above features as claimed by Applicant.

In contrast, Stevens merely discloses a discussion on TCP slow start, congestion avoidance, fast retransmit and fast recovery algorithms for the Internet, and does not teach a process of choosing among the alternate transmission protocols. In particular, with Fast Retransmit, "since TCP does not know whether a duplicate ACK is caused by a lost segment or just a reordering of segments, it waits for a small number of duplicate ACKs to be received., ..., TCP then performs a retransmission of what appears to be the missing segment, without waiting for a retransmission timer to expire." Accordingly, Stevens appears to only show how loss is computed. Therefore, Stevens, like Varshney, does not disclose, teach or suggest including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit.

Indeed, more particularly, Stevens does not disclose or suggest entering a k-recovery phase' whenever the congestion is detected, let alone, entry into a 'k-recovery phase,' which

reduces a congestion window to half its original size, while a slow-start threshold is reduced to half only on a first occasion of entry into the k-recovery phase during a packet loss recovery cycle as claimed by Applicant. Thus, Stevens does not appear to forecast congestion like Applicant's invention. (See Stevens at Abstract; and Section 3, 2nd Paragraph).

Finally, as indicated above, Applicant includes a three state system for improving TCP throughput over lossy communication links without affecting performance over non-lossy links, including a 'k-recovery phase,' which reduces a congestion window to half its original size, while a slow-start threshold is reduced to half only on a first occasion of entry into the k-recovery phase during a packet loss recovery cycle.

For emphasis, Stevens merely discloses a discussion on TCP slow start, congestion avoidance, fast retransmit and fast recovery algorithms for the Internet, and does not teach a process of choosing among the alternate transmission protocols.

For at least the reasons outlined above, Applicant respectfully submits that neither Varshney nor Stevens, alone or in combination, disclose, teach or suggest, including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit as recited in independent claim 8, and similarly independent claim 15, of Applicant's invention.

For the reasons stated above, the claimed invention, and the invention as cited in independent claims 8 and 15, and related dependent claims 9 and 16, is fully patentable over the cited references.

C. The Rejection Based on Varshney in view of Parsa, et al.

Regarding independent claims 8, and 15, and related dependent claims 12-14 and 19-21, first, the references, separately, or in combination, fail to disclose, teach or suggest a reason or motivation for being combined.

Second, even assuming that the references would have been combined, Varshney, as discussed above, does not teach or suggest the features of independent claim 8, and similarly independent claim 15, including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit. (See above, including Office Action, Page 8, Section 11).

Parsa is also deficient.

In contrast, Figure 1 of Parsa merely discloses a method for improving TCP performance over wireless links by differentiating congestion from random loss by relying on a protocol TCP Santa Cruz. Contrary to the assertion in the Office Action, the protocol TCP Santa Cruz only provides that "if a loss occurs in state count = 2, then determines that a loss is due to congestion and implements the congestion avoidance algorithm where "the sender's transmission window is reduced in half." "If a loss is not preceded by at least consecutive intervals of increasing queue length than it is a random loss and the congestion avoidance algorithm is not followed." Accordingly, Parsa does not teach or suggest a first transmission , a second transmission protocol and a third transmission protocol. Further, the slow-start threshold is not reduced to half only on the first occasion of entry into the k-recovery phase during a packet loss recovery cycle as taught by Applicant. Therefore, Parsa, like Varshney, does not disclose, teach or suggest including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit. (See Office Action, Page 9, lines 1-14; Parsa at Abstract; Page 91, Section III; and Figure 1).

In contrast, as indicated above, Applicant includes a three state system for improving TCP throughput over lossy communication links without affecting performance over non-lossy links, including a 'k-recovery phase,' which reduces a congestion window to half its original size, while a slow-start threshold is reduced to half only on a first occasion of entry into the k-recovery

phase during a packet loss recovery cycle.

Indeed, Applicant teaches that at an event 2 with a loss of 2 packets causes the system to go into k-recovery phase where "the loss window once again collapses to half the current value and the 'ssthresh' is adjusted to become equal to new 'lwnd.' Another event 3' occurs at 14 and brings the system onto a 'halt growth' phase and until the occurrence of another event 3 at 15 results in full recovery and reverts it to 'congestion avoidance' phase. Finally, an event 1' at 16 reverts the system to 'halt growth' phase." (See Application, Page 11, lines 11-6).

However, Parsa does not appear to adjust the 'ssthresh' to become equal to a new 'lwnd' as Parsa reverts back and infers a random loss not a congestion avoidance phase.

Indeed, Parsa appears to teach a conventional method as "the value of count is rarely equal to two, we would expect nearly all losses on the wireless links to be considered as random." Thus, "we expect the protocol to simply retransmit most losses without reducing the transmission window," whereas Applicant teaches adjustment of the transmission window using a congestion control algorithm not assuming that "nearly all losses are random." Accordingly, Parsa likely would not improve TCP throughput like Applicant's invention. (See Parsa, Page 91, Section IV).

For at least the reasons outlined above, Applicant respectfully submits that neither Varshney nor Parsa, alone or in combination, disclose, teach or suggest, including choosing a first transmission protocol if congestion is below a first threshold; choosing a second transmission protocol if congestion is between the first threshold and a second threshold; choosing a third transmission protocol if congestion is between the second threshold and a third threshold; and returning to a previous protocol when packet loss exceeds a predetermined limit as recited in independent claim 8, and similarly independent claim 15, of Applicant's invention.

For the reasons stated above, the claimed invention, and the invention as cited in independent claims 8 and 15, and related dependent claims 12-14 and 19-21, is fully patentable over the cited references.

IV. Formal Matters and Conclusion

With respect to the objections to the specifications and claims, the specification and claims have been amended, above, to overcome these objections. With respect to the objection to the drawings, Replacement Sheets are submitted herewith.

In view of the foregoing, Applicants submit that claims 8-28, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

Dated: 10/8/04

Fredric J. Zimmerman
Registration No. 48,747

McGinn & Gibb, PLLC
2568-A Riva Road
Suite 304
Annapolis, MD 21401
Customer Number: 29154